

AMENDMENTS TO THE CLAIMS:

The listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-21 (Canceled)

22. (Currently amended) A disposable cassette for supplying heat exchange fluid to a heat exchange catheter, the disposable cassette configured to be placed in thermal communication with a heating/cooling source, said cassette comprising:

an external heat exchanger having a an inlet and an outlet;

a first fluid supply line, said first fluid supply line in fluid communication with said heat exchange inlet;

a disposable pump head contained in the cassette, said pump head actuated by an electric motor, said pump head having an inlet and an outlet, and said pump inlet in fluid communication with said heat exchanger outlet; and

a second fluid supply line, said second fluid supply line in fluid communication with said pump outlet for receiving fluid pumped out of said pump outlet.

23. (Original) The cassette of claim 22 wherein said electric motor is controlled by an amplifier controller, said amplifier controller supplying a constant current to said pump head thereby causing said pump head to supply a relatively constant pressure to said fluid in said second fluid supply line.

24. (Currently amended) The cassette of claim 22 which further comprises a pressure regulator, said pressure regulator being in fluid communication with said pump outlet for regulating the pressure of fluid pumped from said pump head.

25. (Original) The cassette of claim 22 wherein said pump head is a cardioid vane pump.

26. (Original) The cassette of claim 25 wherein said pump head comprises a rotor that is fitted with a vane for moving fluid from the pump, said rotor being positioned in a quasi-cardioid shaped cavity.

27. (Original) The cassette of claim 26 wherein:

(a) said cavity has a circumference, said rotor has a diameter "D", and said vane has a length "L";

(b) the cavity circumference comprises:

- (i) a first arc defined by  $330^{\circ}$  to  $30^{\circ}$  and having a radius  $R_1$ ;
- (ii) a second arc defined as  $150^{\circ}$  to  $210^{\circ}$  and having a radius  $R_2$ ;
- (iii) a third arc defined as  $30^{\circ}$  to  $150^{\circ}$  and having a radius  $R_3$ ; and
- (iv) a fourth arc defined as  $210^{\circ}$  to  $330^{\circ}$  and having a radius  $R_4$ ;

(c) wherein all measurements are based upon the center of the rotor and 0° is identified with the point midway between the inlet and the outlet of the cavity;

wherein the radii are defined as:

$$R_1 = D/2$$

$$R_2 = L - (D/2)$$

$$R_3 = (D/2) + \{ [(L-D)/2] \cdot [\cos (1.5\Theta + 135)] \}$$

$$R_4 = (D/2) + \{ [(L-D)/2] \cdot [\cos (1.5\Theta - 315)] \}$$

28. (Original) The cassette of claim 22 wherein said pump head is an impeller pump.

29. (Currently Amended) The cassette of claim 22 wherein said pump head is a gear pump.

Claims 30-35 (Canceled)

36. (Currently amended) A cassette for supplying heat exchange fluid to a heat exchange catheter, said cassette comprising:

an external heat exchanger comprising a structural member and a compliant member, said compliant member sealed to said structural member in a pattern, said pattern forming a flow channel having an inlet and an outlet;

a first fluid supply line, said first fluid supply line in fluid communication with said flow channel inlet;

a bulkhead, said bulkhead comprising a reservoir and a disposable pump head, said reservoir containing an inlet in fluid communication with said flow channel

outlet, said reservoir further having a fluid level detector for detecting the level of fluid within said reservoir, said pump head being a cardioid vane pump head, said pump head actuated by an electric motor, said pump head having an inlet and an outlet, and said pump inlet in fluid communication with said reservoir outlet, said electric motor is controlled by an amplifier controller, said amplifier controller supplying a constant current to said pump head thereby causing said pump head to supply a relatively constant pressure to said fluid in said second fluid supply line;

a second fluid supply line, said second fluid supply line in fluid communication with said pump outlet for receiving fluid pumped out of said pump outlet;

an external fluid source, said external fluid source in fluid communication with said reservoir; and

a pressure damper, said pressure damper in fluid communication with said pump outlet.

37. (New) The cassette of claim 22 wherein said first and said second fluid supply lines are connected in a circuit through a heat exchange catheter.

38. (New) The cassette of claim 22, wherein said external heat exchanger comprises a structural member and a compliant member, said compliant member being sealed to said structural member in a pattern, said pattern forming a flow channel between said compliant member and said structural member.

39. (New) The cassette of claim 22, further comprising a reservoir, said reservoir having a reservoir inlet and a reservoir outlet, said reservoir inlet in fluid communication with said external heat exchanger flow channel outlet, said pump inlet in

fluid communication with said reservoir outlet for pumping fluid from said reservoir outlet, and wherein said second fluid supply line is in fluid communication with said pump outlet for receiving fluid pumped out of said pump outlet.

40. (New) The cassette of claim 39 wherein said reservoir further comprises a fluid level detector.

41. (New) The cassette of claim 40 wherein said fluid level detector comprises a prism mounted within said reservoir, an optical beam source and an optical beam sensor, said source and sensor being mounted adjacent to said prism.

42. (New) The cassette of claim 23, wherein said amplifier controller is responsive to signals received from a system controller to vary the current supplied to said electric motor to control the flow of fluid in said second fluid supply line.

43. (New) The cassette of claim 42, wherein the system controller includes a feedback circuit, the feedback circuit being responsive to signals received from sensors in thermal contact with a patient's body to provide control signals to said electric motor to control the flow of fluid in said second fluid supply line.

44. (New) A disposable cassette for supplying heat exchange fluid to a heat exchange catheter, said cassette comprising:

an external heat exchanger having an inlet and an outlet;

a first fluid supply line, said first fluid supply line in fluid communication with said heat exchange inlet;

a disposable pump head contained in the cassette, said pump head actuated by an electric motor, said pump head having an inlet and an outlet, and said pump inlet in fluid communication with said heat exchanger outlet;

a pressure regulator, said pressure regulator being in fluid communication with said pump outlet for regulating the pressure of fluid pumped from said pump head;  
and

a second fluid supply line, said second fluid supply line in fluid communication with said pump outlet for receiving fluid pumped out of said pump outlet;

wherein said electric motor is controlled by an amplifier controller, said amplifier controller supplying a constant current to said pump head thereby causing said pump head to supply a relatively constant pressure to said fluid in said second fluid supply line.